

Remarks

Claims 1-8 and 11-16 are pending. Favorable reconsideration is respectfully requested. Non-elected claims 9 and 10 are hereby cancelled. Claims 1 and 11 are amended.

Claims 11-14 have been rejected under 35 U.S.C. § 112, ¶ 1. Applicants respectfully traverse. The position of the Office appears to be that the claims are not enabled as it would allegedly require undue experimentation to provide a sheet molding compound (“SMC”) which cures in one minute or less. This is incorrect. First, Applicants have clearly provided an SMC which cures in one minute or less. Second, catalysts for cure of SMC are well known, including, *inter alia*, peroxides, peroxyesters, peroxyketones, hydroperoxides, azo compounds, etc. It is believed that the benefits of the vacuum assisted process of claims 11-14 are brought about by the vacuum in conjunction with the short curing time, as opposed to non-vacuum assist methods where the nature of the catalyst may also be important.

Selection of catalyst mixtures, with or without inhibitor, which allow SMC to cure within one minute at 150°C is well within the skill of the art, and requires only routine experimentation. A catalyst-free SMC master batch may be quickly compounded, e.g. in a laboratory kneader, with the catalyst system of choice and molded in a laboratory heated platen mold. Since the compounds useful as free-radical catalysts are well known and commercially available, and as the testing required is only minimal, claims 11-14 clearly meet the requirements of 35 U.S.C. § 112, ¶1. Withdrawal of the rejection of the claims under 35 U.S.C. § 112 is solicited.

Claims 1-8, 15 and 16 have been rejected under 35 U.S.C. § 102 or alternatively under 35 U.S.C. § 103(a) over Buonaura U.S. Patent 5,393,808 (“*Buonaura*”). *Buonaura* is puzzling at best, and is not believed to be an enabling reference. Moreover, *Buonaura* does not disclose compositions in any way similar to those of Applicants, much less one which cures in less than one minute.

Buonaura discloses a curious mixture whose curing regimen cannot even be guessed at. *Buonaura*'s principal resin is (perhaps) a polyester based on hydrogenated bisphenol A. Such polyesters have been known for many years, such as copolymer polyesters prepared by condensation of terephthalic acid and hydrogenated bisphenol A (2,2-bis(4-hydroxycyclohexyl) propane) to form a saturated linear polyester. Such polyesters have no unsaturated groups present, and do not meet the present claim requirements of an unsaturated polyester. *Buonaura* does not teach or suggest that his polyester is unsaturated, and gives no examples of any such polyester, nor any polyester, for that matter.

Buonaura's low profile additive may or may not be unsaturated, but it is not an unsaturated polyester in any case. *Buonaura* describes one such additive as "acrylic modified polyvinyl alcohol." One skilled in the art would not know what is meant by this term. Copolymerization of acrylic acid and vinyl acetate followed by hydrolysis would produce an acrylic modified polyvinyl alcohol free of acrylate unsaturation, but bearing both carboxylic acid groups and alcohol groups, which would be expected to cure by inter and intramolecular crosslinking between the carboxyl and hydroxyl groups. However, such polymers are not polyesters and are not unsaturated.

Alternatively, acrylic acid can, in theory, be reacted with polyvinyl alcohol to esterify the polyvinyl alcohol hydroxyl groups. However, this reaction is complicated due to the propensity of acrylic acid to homopolymerize under the harsh conditions required for esterification. In any case, the result would be an unsaturated polyvinyl alcohol, not an unsaturated polyester.

The low profile additive is supplied in the examples in solution in styrene, which may be why a free radical catalyst is added. Styrene will cure to polystyrene in such a case, and if the "acrylic modified polyvinyl alcohol" also contains unsaturation, it will co-cure. However, neither of these is an unsaturated polyester. Moreover, note that the examples do not include any polyester - they contain only hydrogenated bisphenol, a saturated bicyclic diol.

To anticipate the claims, the reference must disclose each and every claim limitation, either literally or by inherency. However, in a rejection based on inherency, it is well established that the inherency must be certain, *Ex parte Cyba*, 155 USPQ 756 (POBA 1966); *Ex parte McQueen*, 123 USPQ 37 (POBA 1958), and must be the necessary result and not merely a possible result. *Ex parte Keith*, 154 USPQ 320 (POBA 1966).

Here, Applicants find no mention of any unsaturated polyester. If Applicants are incorrect, the Office should point to those portions of the *Buonaura* specification which unambiguously disclose such. Moreover, the *Buonaura* reference does not disclose the limitation of claim 2. The only catalyst concentration of t-amylperbenzoate given is in Example II, at 0.3 parts per 100 parts of composition, below the claimed range. Claims 5, 6, and 15 and 16 require a cure time of less than one minute. *Buonaura* does not disclose any cure time, nor is a cure time of one minute inherent, even when using t-amylperbenzoate, since the *Buonaura* compositions contain no unsaturated polyester, and the saturated polyester they do contain is an unusual one, employing hydrogenated bisphenol (or hydrogenated bisphenol itself - see examples) for which no curing mechanism is known. Claims 7 and 8 require vacuum to be applied during compression molding. *Buonaura* does not even hint at this claim limitation. For these reasons, the rejection over *Buonaura* under 35 U.S.C. § 102 must be withdrawn.

Nor does *Buonaura* render the claims obvious under 35 U.S.C. § 103(a). Again, *Buonaura* fails to teach or suggest using an unsaturated polyester. Moreover, *Buonaura* is not an enabling reference. The complete lack of any reasonable chemical description of the *Buonaura* ingredients, coupled with the failure of *Buonaura* to disclose a single commercial source or method of preparation, would not enable one skilled in the art to practice the invention disclosed by *Buonaura*. A non-enabling reference cannot be used to support a rejection, whether under 35 U.S.C. § 102 or 35 U.S.C. § 103, *In re LeGrice*, 133 USPQ 365, 372 (CCPA 1962); *In re Collins*, 174 USPQ 333 (CCPA 1972), and any ambiguity in a reference's teachings must be resolved in favor of Applicants. *Collins, Id.* Withdrawal of the rejection over *Buonaura* under 35 U.S.C. § 103(a) is solicited.

Claims 1-8, 15, and 16 have been rejected under 35 U.S.C. § 103(a) over *Buonaura* in view of Minke U.S. 5,537,789 ("Minke"). Applicants find no motivation to combine *Buonaura* with *Minke*, and even were the combination proper, it would not teach or suggest the claimed invention. The Federal Circuit has several times recently discussed the combinability of references.

In the case of *In re Anita Dembiczak and Benson Zinbarg*, 50 U.S.P.Q.2d 1614 (Fed. Cir. 1999), the CAFC has indicated that the requirement for showing the teaching or motivation to combine references is "rigorous." *Dembiczak* at 1617. Moreover, this showing, which is rigorously required, must be "clear and particular." *Dembiczak* at 1617. See also, *C.R. Bard v. M3 Sys., Inc.*, 48 U.S.P.Q.2d 1225, 1232 (Fed. Cir. 1998). It is well established that merely because references can be combined, the mere suitability for logical combination does not provide motivation for the combination. See, *Berghauser v. Dann, Comr. Pats.*, 204 U.S.P.Q. 398 (DCDC 1979); *ACS Hospital Systems, Inc. v. Montefiore Hospital*, 221 U.S.P.Q. 929 (Fed. Cir. 1984). Moreover, mere conclusory statements supporting the proposed combination, standing alone are not "evidence". *McElmurry v. Arkansas Power & Light Co.*, 27 U.S.P.Q.2d 1129, 1131 (Fed. Cir. 1993). See also *Ecolochem, Inc. v. Southern Cal. Edison Co.*, 56 USPQ2d 1065 (Fed. Cir. 2000); and in particular, *In re Lee*, 61 USPQ2d 1430 (Fed. Cir. 2002).

Here, the relevant SMC molding compositions of *Minke* include an unsaturated polyester, while *Buonaura* does not disclose any unsaturated polyester. Moreover, while *Minke* is directed to doorskins, *Buonaura* is directed to decorative wear surfaces such as cultured marble, which are entirely different, far from the wood-like doorskins of *Minke*. There is no evidence which would support the proposed combination, much less evidence which rises to the "clear and particular" mandate of *Dembiczak*. In the absence of specific evidence flowing from the references suggesting the combination, the combination is improper and the rejection must be withdrawn.

The combination, even were it proper, also does not teach or suggest the claim limitations of any of the claims, even more particularly claims 5, 6, 7, 8, 15 or 16. There is no mention of the use of vacuum (claims 7, 8); nor is there any indication of the desirability of a short cure time of less than one minute. Applicants have disclosed that such short cure times, most importantly, produce parts with uniform stainability. Neither reference discusses the problem of stainability. *Buonaura* does not discuss stainability at all; his compositions are designed to be devoid of any other surface finish (see, e.g. column 2, lines 26-29). *Minke* discloses stainability, but does not address the problem of uniform stainability. As neither reference even mentions the problem solved, they cannot suggest its solution. *In re Shaffer*, 108 USPQ 326 (CCPA 1956).

The question of obviousness, with *Buonaura* and *Minke* before the skilled artisan, is whether the references (if legally combinable) would direct the skilled artisan to the present invention. Thus, if one were desirous of increasing uniformity of stainability, what would these references suggest? The answer is that they would suggest nothing, either alone or in combination. Neither reference discloses an SMC compression molding process which produces greater uniformity.

What if one were motivated only to increase the speed of the molding process, i.e. to mold in less than one minute? What then would the references teach? *Minke* discloses no curing time; neither does *Buonaura*. While *Buonaura* discloses the catalyst of Applicants' claim 1, he does not indicate that it is faster, better, etc., only that it is preferred. However, the composition of *Buonaura* is not an unsaturated polyester SMC. While t-amylperoxybenzoate might be the catalyst of choice in the *Buonaura* resin system (reason not given), there is no indication that it would be suitable in an unsaturated polyester SMC process. Withdrawal of the rejection over *Buonaura* in view of *Minke* is solicited.

Claims 1-4, 7, and 8 have been rejected over Adembri et al. U.S. 5,596,021 ("Adembri") alone or in view of *Minke*. *Adembri* is directed to two component liquid compositions containing both an unsaturated polyester, a free-radical catalyst, a decomposition

promoter for the catalyst, an isocyanate, and a trimerization catalyst for the isocyanate. These compositions are not related in any way to SMC, which is a one component¹ system generally supplied in the form of sheets which are cut and stacked together prior to being molded under heat and pressure.

The curing time of the *Adembri* system is purposefully controlled to have a long induction time to allow wet-out and penetration of reinforcing fibers, followed by rapid crosslinking (column 7, lines 12-19). Nor are the compositions heated. Rather, heat is generated internally (by trimerization of the isocyanate component into polyisocyanurate), and catalysis is critical to maintaining the long induction time (column 7, lines 19-22). One possible free radical catalyst is t-amylperbenzoate, however none of the Examples employ this catalyst. Rather, all employ t-butylperbenzoate.

These systems have both a gel time and a curing time. The gel time is the time at which crosslinking has occurred to only the extent to form a lightly crosslinked free standing gel, in contrast to the liquid phase, which slowly viscosifies prior to gelation. The gel time is followed by an extended curing phase where additional crosslinking finally results in an article having measurable mechanical properties. When the two components ("A and B sides") are mixed together prior to placement in the mold (which would most closely mimic SMC), the gel time is from one minute to 20 minutes (column 7, lines 58-64). Thus, the complete reaction time, including gelation and curing, will be on the order of 3 to 25 minutes or so. This mode of operation is disfavored, however. The preferred mode of operation is RIM (Reaction Injection Molding) where separate components are introduced into a high pressure impingement mix head and from there directly into the closed mold at high pressure (150 bar). Under these conditions, it is preferred that the gel time be from 10 seconds to 2 minutes,

¹ In a two component system, two (or more) components are mixed just prior to molding, as the constituents begin reacting as soon as they contact each other. In a one component system, all reactive constituents are contained in but a single component, and do not react until exposed to heat (thermal curing) or moisture (moisture curing; i.e. caulk).

followed by the curing phase. In the examples, the total reaction time ranges from 3 minutes to 5 minutes.

As can be seen, the system of *Adembri* is completely different from those of Applicants, and designed for completely different molding tools and conditions. The compositions are liquid, not SMC materials. No ultra-short cure times of less than one minute are taught or suggested. If the cure time were this short, mold filling and fiber penetration could not occur. Thus, rather than teach a short curing time, *Adembri* teaches away, requiring a relatively long gel time in order to fill the mold and wet out the fibrous reinforcement, followed by a curing time.

There is no teaching or suggestion in *Adembri* that t-amylperbenzoate would lower curing time in SMC, since *Adembri* is not involved with SMC, and also desires not to cure too rapidly. *Adembri* also fails to suggest that any improvement in doorskins could be achieved by rapid molding.

Minke is not combinable with *Adembri*, because the compositions employed are too different. At column 3, lines 61-62, *Minke* discloses that an injection moldable composition can be used instead of SMC. Thus, when *Minke* employs SMC, there is no suggestion to combine these references. Moreover, even if combined, there is no teaching than an SMC composition should be catalyzed by t-amylperbenzoate or that a molding time of less than one minute would result in a uniformly stainable doorskin. *Adembri* used only t-butylperbenzoate. Moreover, in the polymer composition of *Adembri*, which includes at least two very different catalysts (free radical and trimerization), a catalyst promoter, and two very different curable resins (isocyanate and unsaturated polyester), there is no telling whether t-amylperbenzoate would be faster or slower acting.

One skilled in the art would not look to *Adembri* for any teaching with respect to use of SMC, or its use in making doorskins. One skilled in the art would consider *Minke*, but *Minke* provides no direction to choose any particular catalyst. Clearly, the claims are non-

obvious over the combination of *Adembri* and *Minke*, and withdrawal of the rejection under 35 U.S.C. § 103 is solicited.

Applicants submit that the claims are now in condition for Allowance, and respectfully request a Notice to that effect. If the Examiner believes that further discussion will advance the prosecution of the Application, he is highly encouraged to telephone Applicants' attorney at the number given below.

Respectfully submitted,

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